

## CLAIMS

We claim:

1. A method to produce a diesel fuel blend having a pre-determined flash-point and a pre-determined increase in cetane number, comprising the steps of:

- a) selecting a stock diesel fuel with a flash-point and a cetane number,
- b) establishing the pre-determined flash-point and the pre-determined increase in cetane number of the diesel fuel blend to be produced;
- c) adding an amount of a first oxygenate with a flash-point less than the flash-point of said stock diesel fuel and a cetane number equal to or greater than the cetane number of said stock diesel fuel, said amount being sufficient to adjust the flash-point of the diesel fuel blend to the pre-determined flash-point; and
- d) adding an amount of a second oxygenate with a flash-point equal to or greater than the flash-point of said stock diesel fuel and a cetane number greater than the cetane number of said stock diesel fuel, said amount being sufficient to achieve the pre-determined increase in cetane number

wherein the first oxygenate and the second oxygenate are not the same oxygenate.

2. The method of claim 1 wherein the first oxygenate is selected from the group consisting of ethers, polyethers, acetals, long chain linear alcohols and esters of fatty acids.
3. The method of claim 1 wherein the second oxygenate is selected from the group consisting of ethers, polyethers, acetals, long chain linear alcohols and esters of fatty acids.

4. The method of claim 1 wherein the first oxygenate is selected from monoglyme, diethylether and diisopropyether.
5. The method of claim 1 wherein the second oxygenate is selected from diglyme, triglyme and dipentylether.
6. The method of claim 1 wherein the said first additive is monoglyme and said second additive is diglyme.
7. The method according to claim 1 wherein the amount of the first oxygenate to adjust the flash point of the stock diesel fuel to the pre-determined flash-point of the diesel fuel blend is determined by the equation

$$T_1/T_2 = 1 + T_1 R \ln[x] / \Delta H$$

wherein  $T_1$  is the flash-point temperature of the first oxygenate,  
 $T_2$  is the pre-determined flash-point temperature of the diesel fuel blend ,  
 $R$  is the ideal gas constant,  
 $\Delta H$  is the enthalpy of vaporization of the first oxygenate and  
 $[x]$  is the mole fraction of the first oxygenate in the diesel fuel blend.

8. The method of claim 1 wherein the amount of the first oxygenate to be added is obtained from a calibration curve established by measuring the flash-point of mixtures of the stock diesel fuel and the first oxygenate.
9. The method of claim 1 wherein the amount of the second oxygenate to be added is obtained from a calibration curve established by measuring the cetane number of mixtures of the stock diesel fuel and the second oxygenate.